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ABSTRACT

As part of an ongoing study of statistics anxiety, 70 doctoral students at 2 research universities completed a Likert-type instrument asking them to rate from "not at all" (1) to "a great deal" (5) the extent to which 17 elements increased the anxiety and 20 elements decreased the anxiety that they experienced in educational research courses. Students were also asked to list additional elements that increased or decreased their anxiety levels. Means and standard deviations were computed for each item in the survey. Ranking at the top for increasing anxiety was the amount of work due for the class, followed by the amount of material covered in class, tests, the difficulty of the work, and the amount of work due for other classes. Ranking at the top for decreasing anxiety was getting a good grade on an assignment, followed by completing an assignment, and receiving encouragement from the teacher. Analyses of the open-ended questions revealed several themes for increasing anxiety, beginning with dissatisfaction with the teaching style of the professor. Themes that emerged for increasing anxiety included the availability of the professor to meet individually with students, help and support from other students, previous experience with statistics, and several other conditions. Several students reported feeling little or no anxiety in educational research classes. The survey instrument is attached. (SLD)

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Running Head: ANXIETY OF DOCTORAL STUDENTS

ED 459 214

Increasing and Decreasing Anxiety:

A Study of Doctoral Students in Education Research Courses

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Paper presented at the
Annual Meeting of the Mid-South Educational Research Association,
Little Rock, AR, November 14-16, 2001

Abstract

As part of an ongoing study of statistics anxiety, 70 doctoral students in two research universities, one in the South and one on the West Coast, completed a Likert-scale instrument asking them to rate from 1 ("Not at all") to 5 ("A great deal") the extent to which 17 elements increased the anxiety and 20 elements decreased the anxiety that they experienced in educational research courses. Items were compiled from the literature on statistics and educational research pedagogy, as well as on answers of students in previous research conducted by the authors. Students also were asked to list additional elements that increased or decreased their anxiety levels.

Means and standard deviations were computed for each item in the survey. Ranking at the top for increasing anxiety was the amount of work due for the educational research class, followed by the amount of material covered in class, tests, the difficulty of the work, and the amount of work due for other classes. Ranking at the top for decreasing anxiety was getting a good grade on an assignment, followed by completing an assignment and receiving encouragement from the teacher.

Analysis of the open-ended questions revealed the following themes for increasing anxiety: dissatisfaction with the teaching style of the professor, working in groups with less motivated students, feelings of being unprepared to take a class at this level, amount of work, the anxiety of other students, personal time management, career/work pressures, testing, inability to understand the textbook, and difficulties with technology. Themes that emerged for increasing anxiety included the availability of the professor to meet individually with students, help and support of classmates, previous experience with statistics, sufficient examples and practice problems, clear explanations of difficult material, and extensive feedback from the professor. Several students reported experiencing little or no anxiety in the educational research classes.

Increasing and Decreasing Anxiety:

A Study of Doctoral Students in Education Research Courses

Students in graduate courses in educational research methodology and statistics courses report high levels of anxiety (Schacht & Stewart, 1990, 1991; Zeidner, 1991). As a result of this anxiety, many students delay enrolling in these courses as long as possible, and some even fail to complete their degree programs (Onwuegbuzie, 1997). A growing body of evidence supports the possibility that a professor of educational research may have some power to at least *reduce* the anxiety inherent in the study of educational research methodology and statistics by encouraging and reassuring the students that they can do the work, addressing the anxiety, using humor, giving open book/open note tests, and promoting cooperative learning in and outside the classroom (Wilson, 1996, 1999a, 1999b). Previous studies (e.g., Wilson, 1996, 1999a, 1999b) have focused primarily on master's degree students in teacher education programs. However, little is known about the anxiety reactions of doctoral students enrolled in statistics and research methodology courses. Thus, the purpose of the present investigation was to examine whether doctoral students have similar experiences with respect to anxiety as do master's students. Specifically, mixed-methodological techniques were utilized. The following research questions were addressed: (a) What, specifically, increases the anxiety levels of doctoral students in research courses? and (b) What decreases their anxiety? It was hoped that findings from this study would provide useful information to statistics instructors who are responsible for teaching doctoral students.

Method

Participants

The participants in this study were 70 doctoral students in educational administration programs at two research universities, one in the South and one on the West Coast. These students ranged in age from 28 to 56, with a mean of 41 years. Twenty-two (31%) were male, and 48 (69%) were female. Participants had completed between 6 and 100 semester hours of doctoral work, with a mean of 31 hours. They had taken from 1 to 7 courses in educational research; most had taken one or two courses. On a scale of 1 ("Hopeless") to 10 ("Confident"), the participants' confidence ratings of their ability to understand and to apply statistics ranged from 1 to 10 ($M = 6.1$, $SD = 2.4$); these sample members' confidence ratings in their ability to undertake educational research from 2 to 10 ($M = 7.5$, $SD = 1.8$).

Instruments and Procedures

A Likert-scale instrument was developed from research on master's degree students (Wilson, 1999a, 1999b, 2000), which had its basis in the prior literature on statistics and educational research pedagogy. The instrument was divided into three parts. The first section asked students to rate from 1 ("Not at all") to 5 (A great deal") the extent to which 20 elements decreased the anxiety they experienced in the educational research course; an open-ended question asked for "other things that reduced" their anxiety levels. The second part of the instrument asked them to rate from 1 to 5 the extent to which 17 elements increased their levels of anxiety, followed by an open-ended item that asked for "other things that increased" their anxiety levels. The third part elicited demographic information, including level of study, age, gender, number of hours taken at the doctoral

level, and number of courses taken in educational research. Students also were asked to rate themselves from 1 ("Hopeless") to 10 ("Confident") their confidence in their ability to undertake statistics problems and educational research (appended).

The questionnaire was configured for an on-line response and sent as an attachment to two professors of educational research, one in a university in the South and one in a university on the West Coast. They, in turn, e-mailed the questionnaire to a total of 100 doctoral students currently or recently (within one year) enrolled in one of their educational research courses. Participants e-mailed their responses to the principal researcher; to preserve anonymity, they were given the option of downloading the questionnaire and mailing it to the researcher. A total of 70 (70%) responded. Numeric responses were analyzed using SPSS 10.0 for Windows (SPSS Inc., 2001). The reliability of scores generated by the instrument, as measured by Cronbach's alpha, was .89. Qualitative responses were categorized by key words and organized into themes by both authors individually and then collectively.

Results

The quantitative data are displayed in order of descending means in Table 1 for those elements that increased anxiety and in Table 2 for those that decreased anxiety. Because it was apparent that respondents did not work with graduate assistants, those items were eliminated from the analysis.

The most prevalent elements for increasing anxiety levels were the amount of work due in the educational research class, the amount of material covered in class, taking tests, the difficulty of the material covered in class, the amount of work in other classes, and preparing individual research projects. The top elements for reducing

anxiety were receiving a good grade on an assignment, completing an assignment, instructor's encouragement, support of peers in class, and support of peers outside of class.

The open-ended prompt, "Other things that increased my anxiety," elicited 54 responses from 37 participants. Table 3 lists the number of responses for the emergent themes.

Dissatisfaction with the professor included such issues as failure to recognize student frustration, not giving clear explanations, going too fast--and going too slow! Problems with working with groups included finding time to meet as a group, dealing with classmates who "did not observe time lines or carry their weight," and group grades, where "my grade is dependent upon another's performance."

In listing things that made her anxious, one student wrote, "The word 'statistics'!" The open-ended prompt, "Other things that reduced my anxiety," elicited 81 responses from 47 participants. Table 4 lists the number of responses for the emergent themes. Other comments about the behavior of the professor included respecting varying backgrounds, exhibiting empathy for students, being flexible, being patient and understanding, having fair and consistent grading practices, encouraging and supporting students, being knowledgeable about the topic, and having an effective teaching style. Time-related comments included having time to complete the work, success at juggling school and work commitments, and preferring shorter classes. Several students felt relatively low levels of anxiety. For example, one student stated, "I felt comfortable with the professor's style, as well as with my own abilities to succeed." Another wrote, "I wasn't anxious. I like statistics."

Discussion

Findings form the present study indicate that in statistics and educational research courses, a significant proportion of doctoral students find the amount and difficulty of the work, alongside formal examinations, to be anxiety producing. Interestingly, preparing research projects causes more stress than presenting the results of that research, and working on individual projects is more stressful than working within a group situation. Further, personal and family problems, as would be expected in this group of mid-career teachers and administrators, cause a considerable amount of stress as students attempt to balance school, work, and personal lives. Particularly noteworthy is the fact that dissatisfaction with the teaching style of the professor can contribute to anxiety in the educational research course, as can those stressors more directly related to the student: lack of academic preparation, time management problems, and difficulty with technology. Conversely, reading research and critiquing research articles are relatively low on the list of things that cause anxiety in educational research courses.

These doctoral students tend to experience many of the same stressors as do master's degree students described in previous research (Wilson, 1999a, 1999b). Both groups experience anxiety about the amount of work in quantitative-based research courses. Both populations report elevated levels of anxiety in testing situations and when working in groups in which group members are less motivated or capable than they are. Juggling work, school, and families is stressful for both groups. However, there are some notable differences: master's degree students appear to be more anxious about undertaking statistics problems, working with computers, and presenting the results of their research to classmates than are their doctoral counterparts. Doctoral students note

that the anxiety of their classmates is itself anxiety producing, a theme not previously noted in research on master's students.

There is nothing so anxiety relieving to doctoral students (and all students, we presume!) as completing an assignment and getting a good grade. Encouragement of the professor and support from peers both inside and outside the classroom also are high on the list of stress reducers. These doctoral students also find that excellent instructional practices can relieve the stress they encounter in quantitative-based research courses: clear explanation of the subject material, sufficient examples and sample problems, and extensive feedback from the professor, especially in one-on-one, face-to-face discussions. They also report that having previous experience makes these courses less stressful.

It is interesting to note that although peer support ranks high on the list of stress reducers, working with a group in class and outside of class does not rank nearly as high; again, this is evidence that working in a group can be a mixed blessing, depending on the composition of the group.

When compared with master's level students, the doctoral students seem less easily influenced by the personal teaching style of the instructor. Although they value highly encouragement by the professor, they are much less likely to find the instructor's recognition of student anxiety and his or use of humor in the classroom as anxiety reducing. Doctoral students also consider test-related strategies, including open book/open note tests, to be helpful, but not to the same extent as do master's students, who ranked this item at the top of the list.

Conclusions

Although it is dangerous to generalize too dramatically from small groups of widely dispersed students, perhaps these conclusions are worth considering:

- Doctoral students, like master's students, experience a considerable amount of anxiety in quantitative-based educational research courses.
- Some of the stress they experience is outside the reach of the instructor, including poor academic preparation and family and career pressures.
- Sometimes, "just doing it," i.e., completing an assignment and doing it well, is necessary for alleviating anxiety.
- Excellent instruction, including clear explanation of the subject matter with lots of example, is an important stress reliever.
- Extensive feedback from the professor in individual conference can do much to reduce the stress doctoral students feel as they attempt their initial forays into the world of educational research.
- The encouragement of the professor is an important tool for reducing stress and enabling students to succeed in educational research courses.
- Master's degree students may be more sensitive to the affect of the professor and may require more nurturing than do doctoral students if they are to be successful in these courses.

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Table 1

Mean Scores of Items that Increased Anxiety (N = 70)

Item	n	M	SD
Amount of work due in educational research class	68	3.68	1.19
Amount of material covered in class	68	3.57	1.10
Taking tests	51	3.55	1.14
Difficulty of material covered in class	68	3.54	1.06
Amount of work in other classes	68	3.43	1.08
Preparing individual research projects	67	3.40	1.10
Personal or family problems	61	2.97	1.46
Presenting individual research projects	68	2.88	1.25
Preparing group research projects	51	2.59	0.98
Presenting group research projects	51	2.47	1.06
Personal illness	51	2.29	1.32
Working with a group	57	2.14	0.95
Doing stats problems in class	65	2.12	1.26
Writing journal article critiques	55	2.09	0.97
Doing computer assignments in the lab	65	2.06	1.01
Reading research articles	66	1.95	0.88
Physical set-up of the room	62	1.69	0.98

Table 2

Mean Scores of Items that Decreased Anxiety (N = 70)

Item	n	M	SD
Getting a good grade on an assignment	69	4.58	0.65
Completing an assignment	70	4.29	0.78
Instructor's encouragement	69	4.12	1.01
Support of peers during class	70	4.11	1.00
Support of peers outside of class	66	4.08	1.00
Open book/Open note tests	56	3.96	1.19
Instructor's recognition of anxiety of students	66	3.91	1.06
Guidelines or rubrics provided for grades	66	3.91	1.20
Working with a partner on in-class assignments	59	3.90	0.99
Working with a partner on computer assignments	57	3.79	1.13
Knowing the professor is sympathetic to personal/family priorities	60	3.78	1.21
Being able to bring up a test grade	48	3.71	1.35
Instructor's use of humor in the classroom	67	3.70	1.06
Working with a group on in-class assignments	60	3.50	1.31
Working with a group on a research project	59	3.37	1.24
Instructor's reputation	64	3.06	1.27
Easy to get an "A"	51	2.96	1.20
Working on a research project	69	2.83	1.22

Table 3

Themes: Increasing Anxiety (N=54)

Theme	Number	Percent
Related to the professor:		
Dissatisfaction with teaching style of the professor	6	11%
Amount of work	6	11%
Related to classmates:		
Working in groups with less motivated/less able students	6	11%
Anxiety of other students	5	9%
Related to the student:		
Being academically under-prepared	5	9%
Testing issues	3	6%
Personal time management problems	3	6%
Inability to understand the textbook	2	4%
Difficulties with technology	2	4%
Career or work pressures	2	4%
Other	14	26%

Table 4

Themes: Decreasing Anxiety (N=81)

Theme	Number	Percent
Related to the professor:		
Availability of the professor for individual conferences	11	14%
Extensive feedback from the professor	5	6%
Clear explanations of subject material	5	6%
Sufficient examples and sample problems	3	4%
Other comments about the professor	10	12%
Related to support of classmates	6	7%
Related to time	6	7%
Related to the student:		
Previous experience with statistics	5	6%
Not anxious	5	6%
Other	25	31%

The purpose of this survey is to examine the effectiveness of strategies that professors in educational research and/or statistics classes use to reduce student anxiety in their courses.

Surveys may be returned via e-mail. If you wish to preserve your anonymity, please download the file at the end of this e-mail and return it to: Dr. Vicki Wilson, Chair, Education Department, Wilmington College, 251 Ludovic St., Wilmington, OH 45177. Results of this survey will be presented at an interactive symposium on teaching educational statistics at the annual meeting of the American Educational Research Association on April 13, 2001.

Please answer these questions based on the educational research and/or statistics classes you are taking or have taken in your doctoral program.

Please write your response in the blank to the left of the prompt. Use the following scale: 1=Not at all, 3=Some, 5=A Great Deal, with 2 and 4 as intermediate categories. Write "N" if you did not experience these situations.

<u>To what extent did the following REDUCE your anxiety?</u>

1._____ Working with a partner on in-class assignments

2._____ Working with a group on in-class assignments

3._____ Working with a partner on computer assignments

4._____ Working on a research project

5._____ Working with a group on a research project

6._____ Support of peers during class

7._____ Support of peers outside of class

8._____ Instructor's recognition of anxiety of students

9._____ Instructor's use of humor in the classroom

10.____ Instructor's reputation

11.____ Instructor's encouragement

12.____ Completing an assignment

13.____ Open book/Open note tests

14.____ Being able to bring up test grade

15.____Getting a good grade on an assignment

16.____Guidelines or rubric provided for grades

17.____ Easy to get an "A"

18.____ Having a graduate assistant to "translate"professor's explanations

19.____ Having a graduate assistant to support andencourage me

20.____ Knowing professor is sympathetic to personal/family priorities

Other things that reduced my anxiety:

1.

2.

Please write your response in the blank to the left of the prompt. Use the following scale: 1=Not at all, 3=Some, 5=A Great Deal, with 2 and 4 as intermediate categories. Write "N" if you did not experience these situations.

<u>To what extent did the following INCREASE your anxiety?</u>

1._____ Personal or family problems

2._____ Personal illness

3._____ Amount of material covered in class

4._____ Difficulty of material covered in class

5._____ Amount of work due in ed research class

6._____ Amount of work in other classes

7._____ Doing stats problems in class

8._____ Reading research articles

9._____ Taking tests

10.____ Doing computer assignments in the lab

11.____ Writing journal article critiques

12.____ Preparing individual research projects

13.____ Presenting individual research projects

14.____ Preparing group research projects

15.____ Presenting group research projects

16.____ Working with a group

17.____ Physical set-up of the room

Other things that increased my anxiety:

1.
2.

Please complete the following:

Gender _____ Male _____Female

Age _____Years

Level of study _____Master's _____Doctorate

Number of hours completed in above program _____

Number of educational research or statistics classes taken _____

Confidence in ability to do statistics problems (1=hopeless, 10=confident) _____

Confidence in ability to do educational research (1=hopeless, 10=confident) _____